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Abstract of the Disclosure

A method of fabricating an integrated circuit includes forming an isolation trench in a semiconductor substrate and partially filling the trench with a dielectric material so that at least the sidewalls of the trench are coated with the dielectric material. Ions are implanted into the substrate in regions directly below the isolation trench after partially filling the trench with the dielectric material. The dielectric along the sidewalls of the trenches can serve as a mask so that substantially all of the ions implanted below the isolation trenches are displaced from the active regions. The dielectric along the sidewalls of the trenches serves as a mask so that substantially all of the ions implanted below the isolation trenches are displaced from the active regions. After the ions are implanted in the substrate below the trenches, the remainder of the trench can be filled with the same or another dielectric material. The trench isolation technique can be used to fabricate memory, logic and imager devices which can exhibit reduced current leakage and/or reduced optical cross-talk.

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